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Ethics of the Electrical Engineer

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PROFESSIONAL engineers deal primarily with the forces of nature and are, therefore, governed in their work by the laws of nature; as mother nature demands and insists upon absolute obedience to her laws from which there is no appeal and which cannot be circumvented, the engineer is, by the very nature of his profession, brought up to respect and obey the laws which are fundamental to his work. Any violation of these laws is certain to bring its own punishment with it, even without a trial, either in showing the ignorance and therefore unfitness of the violator, or, what is worse, the deliberate practice of what he knew was wrong. Moreover, many human lives are often at stake when an engineering structure fails; hence the engineer realizes that his responsibility in many cases is very great.

As has often been said by way of comparison, the physician can bury his mistakes six feet under the ground, the lawyer can pass the blame to the jury, court, or witnesses, and the minister can often find a quotation from the Bible which, taken literally, may seem to uphold him in a mistake he may have made; but when the engineer makes a mistake or violates the laws which are fundamental to his profession, he cannot hide the blame or pass it to others. Since, then, there is generally no question who is responsible, and no escape from censure, he must be doubly sure of what he does and how he does it. His profession is therefore by its very nature on a high plane, as far as it concerns obedience to the laws of nature, a thorough knowledge of his branch of learning, which involves a higher education

extending over many years, conscientiousness, and regard for the effect of his work on others.

Training in such an atmosphere cannot fail to have an important bearing on the ethics of engineering conduct; the records of the professional lives of many noted engineers bear this out, as does also the ruination, professionally as engineers, of those who have violated the principles of a high code of ethics. "The engineer's intellectual relations with his subject involve a contact with nature and her laws that breeds straight thinking and directness of character and for these the world is constantly according him a higher and more honorable place."¹

ENGINEERING AS A PROFESSION

That engineering is recognized as one of the so-called "learned professions" and as such is in a class with the medical, legal and other professions, is probably now generally conceded, at least when the nature of the work is limited to true engineering as distinguished from commercial work, and is based on high educational qualifications acquired at a college of good standing, supplemented by years of experience and training and the intelligent application of such knowledge. The requirements in educational qualifications and training are quite as great, if not greater than for some of the other professions. But to the mind of the public, unfortunately, the term "engineer" often means the mechanic who operates a locomotive or some other form of engine.

The preceding statements apply to the profession of engineering in general,

¹ (Gano Dunn.)

embracing four main divisions, electrical, mechanical, civil and mining, with many sub-divisions. Though the particular codes of ethics of the various branches may differ somewhat, owing to the differences in the nature of the work, in general they are based on the leading, centuries-old principle, "Do unto others as you would be done by," and not on that modern version of it, used by some business men, "Do others or they will do you."

The "Code of Principles of Professional Conduct" adopted by the American Institute of Electrical Engineers is published elsewhere in this volume.² The present article will be limited to replies to some of the questions which the author has been asked, concerning his profession.

The American Institute of Electrical Engineers, organized in 1884 and having a membership of between 12,000 and 13,000, is the only large, national society of electrical engineers, including in its membership all the leading men of this division of the engineering profession. It may be said to be the law-making organization of this division, and its high motives may be relied upon. It is supported by membership dues and has three grades of members, of which the much coveted highest grade, that of fellow, is restricted to those who have certain high qualifications. Young men have easy access to associate membership; for the advancement to full membership definite requirements are necessary, referring chiefly to the applicant's record and to the reputation he has gained by his work in the past. There are many other societies and organizations dealing with special branches and they may have their own code of ethics, but this is the senior or parent institution for the electrical engineering profession.

² See Appendix, page 274.

That its members have respect for high principles of proper professional conduct is indicated by the fact that no member has ever yet been expelled, though in one case a member whose conduct was being investigated by the Committee on Professional Conduct, resigned before the case was concluded, and his resignation was promptly accepted. A small number of other cases have been considered by this Committee from time to time. At present a recommendation is under consideration that a brief statement of such cases and the actions taken be published in the monthly publication of the Institute, without giving any names.

The clause in the constitution governing the subject of expulsion is as follows:

Sec. 15. Upon the written request of ten or more Fellows, Members or Associates that, for cause stated therein, a Fellow, Member or Associate of the Institute be expelled, the Board of Directors shall consider the matter, and if there appears to be sufficient reason, shall advise the accused of the charges against him. He shall then have the right to present a written defence, and to appear in person or by duly authorized representative before a meeting of the Board of Directors, of which meeting he shall receive notice at least twenty days in advance. Not less than two months after such meeting, the Board of Directors shall finally consider the case, and if in the opinion of the Board of Directors a satisfactory defence has not been made, and the accused member has not in the meantime tendered his resignation, he shall be expelled.

THE NEED FOR PRINCIPLES OF ENGINEERING CONDUCT

From the nature of the different engineering branches, differences arise which have some bearing on professional conduct. Under the broad term of electrical engineers, there are included salesmen, contractors, manu-

facturers, administrators, organizers, financiers, promoters, etc., many of whom may have started as college-bred engineers, but have branched off into these other vocations, for which they were often very well fitted by reason of their engineering training. Their interests are, however, sometimes directly opposed. To manufacturers and those entrusted with the selling of a product or project, "the exigencies of selling are so constantly forced upon them, that it produces in their circles a commercial atmosphere quite at variance with strict professional views," to quote from a leading engineering journal. Technical journals themselves may not always be free from the influence of their advertisers. Another technical journal last year said editorially, "It is to be hoped that the year 1921 will see real progress in the establishment of codes of ethics in the various engineering societies, or, better, the establishment of general fundamental principles of engineering ethics on which the individual societies may build." Still another technical journal asks, "Is engineering a profession or a business?" and implies that it must be one or the other, stating that "we are at the parting of the ways." This distinction refers to the modern large organizations, as distinguished from the individual engineer, in conducting engineering work; it implies the old saying that "corporations have no souls." The differences between the ethics of such large organizations and of the individual engineer is a subject of discussion which space does not permit going into here.

Within the near past, another departure of a somewhat psychological nature has been added to the engineering profession, that of the science of dealing with men, as exemplified in the legend in the great National Engineering Library in New York

City, which states as a conception of engineering: "Engineering—the art of organizing and directing men, and of controlling the forces and materials of nature for the benefit of the human race." The last part of this legend was formerly one of the definitions of an engineer; the former clause has more recently been added, though not by unanimous consent. In the opinion of some, the term engineering is being broadened too far.

It is often difficult to draw sharp lines between the many different practices, as to where true engineering begins and ends. The title of "engineer" is a coveted one, and rightly so, as long as it implies a long and difficult course of education and training, and it is therefore natural that its appropriation is broadening. A code of ethics is naturally a different matter for one who deals with the application of nature's laws of matter and energy for the benefit of mankind, than for one who deals merely with getting the largest number of dollars; though of course the true engineer must of necessity also consider the cost of projects. For the purposes of the present article, however, the term professional engineer may be supposed to apply to those who occupy themselves exclusively with the true profession of engineering, in its older sense of applying the laws of matter and energy to the benefit of mankind by the design, construction and use of engineering structures. The statement of Francis Bacon in the preface to his "Maxims of the Law" applies to professional engineers as well: "I hold every man a debtor to his profession, from the which as men of course do seek to receive contenance and profit, so ought they of duty to endeavor themselves by way of amends to be a help and ornament thereunto."

THE ENGINEER AND PUBLIC SERVICE

As the progress of the world, the comforts of man and his ability to produce, are so very largely due to the work of the engineer, his work is of the very greatest importance; he therefore naturally interests himself also in the public welfare in behalf of which he should "be ready to apply his special knowledge, skill and training for the use and benefit of mankind," and with loyalty to his country, evidence of which was shown in the recent War, which, to a greater extent than ever before, was dependent on the skill of the engineer.

In connection with testimony by engineers in legal cases, a clause in one of the engineering codes says: "To render reports or testimony intended to deceive is highly unprofessional," a maxim which contrasts with the guiding principle of some lawyers: "Win the case; win it honestly if you can, but win it."

The engineer's work is often connected with some form of public service and he is therefore concerned with the public and with public welfare. His obligations to serve the public conscientiously to the best of his abilities are thereby instilled into him; his natural repugnance to act against the interest of the public, or of those in his charge, when urged to do so by his less scrupu-

lous superior officer, perhaps a politician, a contractor or a financier, has cost many an engineer his position.

Untiring efforts are made by those of experience in the profession to advance the standards of education and training of the rising generation of engineers in the schools and colleges; the subject is frequently discussed at the sessions of the American Institute of Electrical Engineers between those who know what is needed in actual practice and those who do the teaching and training; both willingly coöperate to the great advantage of the student.

Any special recruiting for the profession of electrical engineering seems hardly necessary, as the great interest taken by many young men in this branch of engineering seems to be sufficient.

An employment service is conducted by the Institute; in general, any form of service pertaining to electrical engineering, either to its members, the profession, the public, or the government, which is of such a nature that it can best be done by this large national organization, including in its membership all the leading electrical engineers of the country and many in foreign countries, is willingly undertaken and intelligently carried out. In many instances, the Institute has set an example to others.

Procedure in Developing Ethical Standards Adopted by the American Association of Engineers

By H. W. CLAUSEN

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THE maintenance of the proper ethical relations of the professional engineer both with the public and with his fellow engineers is becoming of great importance in the effort to

develop the service of the engineer to its maximum of usefulness. Clearly, one of the essentials to a constructive and vigorous policy leading to the harmonious coöperation of all concerned,